

# STORING AND RETRIEVING OF FIELD DESCRIPTORS IN JAVA COMPUTING ENVIRONMENTS

## ABSTRACT OF THE DISCLOSURE

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Improved techniques for storing and retrieving field descriptors in  
Java computing environments are disclosed. The techniques can be used  
to implement garbage collection for Java programs in a manner that is more  
efficient, especially for systems with limited resources (e.g., embedded  
10 systems). A reference identifier suitable for use by a Java virtual machine  
is disclosed. The reference identifier is associated with a Java object and  
can be stored in the internal class representation associated with the Java  
object at load time. Moreover, the reference identifier can be used at  
runtime to quickly determine whether a field of the associated Java object is  
15 a reference to another Java object. As a result, the amount of processing  
conventionally performed at runtime is reduced. This, in turn, can improve  
the runtime performance of Java virtual machines, especially those  
operating with limited resources (e.g., embedded systems).

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